

### REMARKS

Claims 4 to 13 and 15 to 17 remain pending in this application, with Claims 12 and 13 being independent. Claims 1 to 3 previously were cancelled. Claim 14 is cancelled herein. Claims 4, 5, 7, 8, 12 and 13 are amended herein.

In the Official Action, Claims 6 and 10 to 17 were rejected under 35 U.S.C. § 102(e), as anticipated by U.S. Patent Application Publication No. 2003/0043462 (Sekine), and Claims 4, 5 and 7 to 9 were rejected under 35 U.S.C. § 103(a), as unpatentable over the Sekine '462 published application. Reconsideration and withdrawal of the rejections respectfully are requested in view of the above amendments and the following remarks.

The rejections of the claims over the cited art respectfully are traversed. Nevertheless, without conceding the propriety of the rejections, Claim 14 has been canceled and Claims 4, 5, 7, 8, 12 and 13 have been amended herein more clearly to recite various novel features of the present invention. Support for the proposed amendments may be found in the original application, e.g., in original Claim 1. No new matter has been added.

The present invention relates to a novel diffractive optical element, and a device manufacturing method using such an element. In one aspect, as now recited in independent Claim 13, the diffractive optical element of the present invention has a design wavelength  $\lambda$ , and comprises a diffractive surface for diffracting predetermined light corresponding to the design wavelength  $\lambda$ , and an alignment mark. The alignment mark has a shape such that, with regard to the predetermined light, a phase difference

corresponding to a multiple, by an integer, of the design wavelength  $\lambda$  is produced between (i) a light ray, of the predetermined light, as transmitted through or reflected by the alignment mark and (ii) a light ray, of the predetermined light, as transmitted through or reflected by a portion adjacent to the alignment mark, and that, with regard to second light of a second wavelength  $\lambda'$  different from the design wavelength  $\lambda$ , no phase difference corresponding to a multiple, by an integer, of the second wavelength  $\lambda'$  is produced between (a) a light ray, of the second light, as transmitted through or reflected by the alignment mark and (b) a light ray, of the second light, as transmitted through or reflected by a portion adjacent to the alignment mark, whereby a position of the alignment mark is detected using the light of the second wavelength, and alignment of the diffractive surface with a predetermined member is performed on the basis of the detected position.

Independent Claim 12 recites similar features with respect to a device manufacturing method, comprising the steps of exposing a substrate with a pattern device, projected from an exposure apparatus having such a diffractive optical element, and developing the exposed substrate.

In each aspect, the present invention relates to the novel feature where light of a second wavelength (which does not produce a phase difference corresponding to an integer multiple of the wavelength) is used to detect the position of the alignment mark, and alignment of the diffractive surface with a predetermined member is performed on the basis of the detected position.

Applicant submits that the prior art fails to anticipate the present invention. Moreover, Applicant submits that there are differences between the subject matter sought

to be patented and the prior art, such that the subject matter taken as a whole would not have been obvious to one of ordinary skill in the art at the time the invention was made.

The Sekine '462 publication relates to an optical unit having plural optical elements, and discloses an optical unit including a first optical unit and a second optical unit. However, Applicant submits that the Sekine '462 publication fails to disclose or suggest at least the above-discussed features of the present invention. Rather, the Sekine '462 publication is understood only to disclose a diffractive surface (25b,26b) with an alignment mark (25a,26a) for producing a phase difference of length corresponding to an integer multiple of the light wavelength (see, e.g., paragraph no. 15). Nowhere is the Sekine '462 publication understood to disclose or suggest using light of a second wavelength to detect the position of the alignment mark and, on the basis thereof, to align the diffractive surface with a predetermined member, as disclosed and claimed in the present application.

For the foregoing reasons, Applicant submits that independent Claims 12 and 13 are allowable over the applied art.


The remaining claims depend from independent Claim 13, and are believed allowable for the same reasons. Moreover, each of the dependent claims recites additional features in combination with the features of base Claim 13, and is believed allowable in its own right. Individual consideration of the dependent claims respectfully is requested.

This Amendment After Final Rejection is an earnest attempt to advance prosecution and is believed to clearly place this application in condition for allowance. Applicant believes that the Amendment reduces the number of issues for appeal. This

Amendment was not earlier presented because Applicant earnestly believe the prior Amendment placed the subject application in condition for allowance. Applicant requests entry of this Amendment under 37 C.F.R. § 1.116.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Chris Wrist", is written over a horizontal line. The signature is enclosed within a large, hand-drawn oval.

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